

and culverts swept into lake; rivers in this vicinity not as high since 1837. Alliance, Stark Co. Ohio, creeks overflowed; lowlands deluged. At Minerva, Ohio, the water rose to a depth equal to the great flood of 1861. Cleveland Ohio, 13th, houses flooded. Erie Pa., 12th, 13th, Mill creek overflowed; dams, culverts and bridges swept away. Oswego, N. Y., 14th, 100 feet of pier on east side of harbor washed away. In Ontario, Sept. 13th, at Oakville, considerable damage by floods and wash-outs. St. Catharines, lower half of Welland canal entirely submerged; navigation suspended until 23d. Markham, heaviest flood since 1851—bridges on river Rouge carried away—Toronto and Nipissing rail-road badly washed. In Scarboro and Toronto Cos., nearly all bridges were swept away. At Brantford, Sept. 15th, large amount of property destroyed by flood. W. Brantford, entirely submerged; iron bridge across Grand river gave way. At Galt, Grand river overflowed banks, doing much damage.

Drought—Corsicana, Tex., 30th, recent rains have relieved the drought in some sections, while in others farmers are compelled to drive their stock many miles to water. Independence, Kan., 30th, corn crop severely injured by drought. Lebanon, Mo., 25th, tobacco crop almost a failure. Contoocookville, N. H., 30th, streams lower than ever before for many years, many wells have failed.

Hail.—Winnemucca, Nev., 16th; Pike's Peak, 1st, 2d, 8th, 19th, 30th; Stockton, Tex., 18th; Milwaukee, 25th; Chicago, 25th; Toledo, 2d; Logansport, Ind., 24th; Fort Hays, Kan., 19th; Camp Douglass, Utah, 18th; Fort Fred. Steele, Wy. Ty., 8th; Summitt, Col., 6, 18th; Geneseo, Ill., 24th; Milford, Ind., 25th; Guttenburg, Iowa, 19th, 25th; Litchfield, Mich., 2d; Frankfort, Mo., 26th; Macon, Mo., 23d; Pierce City, Mo., 25th; Ashley, Mo., 25th; Plattsmouth, Neb., 19th; Genoa, Neb., 5th; Acton, N. J., 4th; Flushing, N. Y., 28th.

Rainy Days.—The number of days on which rain or snow has fallen, varies as follows: New England, 7 to 15; Middle States, 7 to 13; South Atlantic States, 7 to 20; Gulf States, 2 to 18; Ohio valley and Tennessee, 7 to 13; Lower Lake region, 9 to 15; Upper Lake region, 6 to 18; Upper Mississippi valley, 6 to 13; Lower Missouri valley, 5 to 8; Northwest, 8 to 12; Rocky Mountains, 6 to 11; Western Plateau, 0 to 8; Pacific coast, 0 to 8.

Cloudy Days.—For New England, the number varies from 6 to 13; Middle States, 6 to 14; South Atlantic States, 4 to 15; Gulf States, 2 to 9; Ohio valley and Tennessee, 4 to 6; Lower Lake region, 5 to 9; Upper Lake region, 6 to 13; Upper Mississippi valley, 0 to 9; Lower Missouri valley, 4 to 9; extreme Northwest, 8 to 14; Rocky Mountains, 1 to 11; Western Plateau, 0 to 5.

Snow is reported to have fallen as follows: At Ft. Fred Steele, Wy. Ty., 9th; Summit, Col., 7th, ground about station covered with snow; Boise City, Idaho, 27th, 30th, on Boise Mts.; Winnemucca, Nev., 30th, all the highest peaks in sight capped with snow; Pikes Peak, Col., 1st, 4th, 5th, 6th, 7th, 30th; Marquette, Mich., 21st; Pembina, Dak., 20th; Lead City, Dak., 8th, 9th, 19th; Virginia City, Mont., 7th, on mts., 8th, 24th, 30th; Coalville, Utah, 30th, first snow on mts., SW. of station.

Rain from a Cloudless Sky.—Des Moines, Iowa, 17th.

RELATIVE HUMIDITY.

The average percentage of relative humidity for the month ranges as follows: New England, 70 to 85; Middle Atlantic States, 68 to 82; South Atlantic States, 75 to 81; East Gulf States, 66 to 78; West Gulf States, 64 to 76; Lower Lake region, 70 to 74; Upper Lake region, 67 to 78; Ohio Valley and Tennessee, 63 to 73; Upper Mississippi valley, 60 to 73; Lower Missouri valley, 61 to 67; Red River of the North valley, 74 to 79; Eastern slope, from Dakota to interior of Texas, 45 to 67; Western Plateau, 23 to 49; California, 41 to 76. High stations report the following, not corrected for altitude: Mt. Washington, 83; Cheyenne, 51; Denver, 44; Santa Fe, 37; Virginia City, 54; Colorado Springs, 46.

WINDS.

The prevailing winds at the Signal Service stations are shown by arrows on chart No. II, by an examination of which it will be seen that they have been northeasterly in the Atlantic States and generally southerly west of the Alleghanies.

Total Movements of the Air.—The following are the *largest* monthly movements recorded at the Signal Service stations, viz: Cape Lookout, 12,641 miles; Kittyhawk, 11,385; Portsmouth, N. C., 11,353; Sandy Hook, 10,278; Key West, 10,142; North Platte, 10,018; Cape Hatteras, 10,010; Cape Henry, 9,791; Dodge City, 9,703; Breckenridge, 9,463; Cape May, 9,377; Barnegat, 9,330; Atlantic City, 8,931. The *smallest* are: Knoxville, 1,380 miles; Visalia, Cal., 1,391; La Mesilla, N. M., 1,642; Nashville, 1,953; Uvalde, Tex., 1,987; Lynchburg, 2,045; Roseburg, Or., 2,069; Eagle Pass, Tex., 2,369; Shreveport, La., 2,797; Virginia City, Mont., 2,820; Fredericksburg, Tex., 2,822. The anemometer on the Summit of Mt. Washington was stopped by frost on the 15th, since when no continuous record has been obtainable.

Local Storms.—5th, New York and vicinity, severe thunder-storm; 3 a. m., house struck by lightning; at Greenpoint, rain fell in torrents; Brooklyn, 4 a. m., oil works struck and fired; at East Marion, house struck by lightning; Jersey City, Railroad washed, and flag pole struck by lightning. 6th, Ardenia, N. Y., afternoon, violent gale, uprooting trees, &c., path hundred yards wide. 12th, Goldsboro, Wayne Co., N. C., "terrific and destructive tornado, passed three miles from city about 7 a. m., path hundred yards wide;

every house demolished, and debris scattered around country; negro killed and body blown considerable distance; four people injured, one afterwards died, hogs, cows and horses killed." A tornado also probably originated near Stoney creek and, moving WNW., passed about 1½ mile east of Ford's depot in Dinwiddie Co.; about 12 p. m. it swept across the Atlantic, Mississippi and Ohio R. R. in a northerly direction; track, 40 and 50 feet wide, soon spreading to about 300 feet; trees, barns and small houses blown down, and timbers scattered broad-cast; a little later a tornado is reported to have crossed the Richmond and Danville R. R. at two points, one or two miles west of Burkeville, trees twisted off, &c., course NW. In Chesterfield Co., between Summit and Clover Hill, "for a distance of eight miles, and width of 100 yards, destroyed everything, and houses completely demolished; eight persons injured." At Boshers' Dam, cyclone passed into Henri Co., "ravage fearful to contemplate; buildings demolished; one person killed, several injured." In Hanover Co., at Short Pump, "tornado took a NW. direction, track 125 yards wide, sweeping everything, cutting an avenue through the woods." 12th, "the 'Northeaster' did considerable damage to shipping on Lake Erie." "Schooner 'Starling' went ashore two miles east of Vermillion." "Schooner 'Everly,' at Pigeon Bay, parted anchors." Schooner "Provost" parted anchor at Put in Bay, and was driven on outside bar. At Baumhart Inlet, near North Amherst, Ont., schooners "Sterling" and "Light" were totally wrecked.

VERIFICATIONS.

Indications.—The detailed comparison of the tri-daily weather indications with the telegraphic reports, for the succeeding twenty-four hours, shows a general percentage of omissions of 0.7 per cent, and of verifications of 84.9 per cent. The percentage of verifications for the four elements have been: weather, 89.3; wind, 81.6; temperature, 85.5; barometer, 83.4. The percentages of verifications by geographical districts have been: New England, 83.5; Middle States, 85.9; South Atlantic States, 89.2; East Gulf States, 83.4; West Gulf States, 89.5; Lower Lake region, 81.9; Upper Lake region, 83.3; Tennessee and Ohio valley, 85.8; Upper Mississippi valley, 84.2; Lower Missouri valley, 82.8. Of the 3,573 predictions that have been made, 124, or 3.5 per cent are considered to have entirely failed; 147, or 4.1 per cent were one-fourth verified; 436, or 12.2 per cent were half verified; 342, or 9.6 per cent were three-fourths verified; 2,524 or 70.6 per cent were fully verified, so far as can be judged from the weather maps.

Cautionary Signals.—During the month 158 Cautionary Signals were displayed; 130, or 82.3 per cent, were justified by subsequent hourly velocities of 25 miles or over at, or within, 100 miles of the station.

Cautionary Off-shore Signals.—Of these, seventeen were displayed, of which 14 or 82.4 per cent. were justified, both as to velocity and direction, at or within 100 miles of station; of the remaining three, one was justified as to direction but not by velocity, and two were not justified by either. Forty-three cases were reported, generally from scattered stations, of winds of 25 miles or over, when signals were not ordered.

NAVIGATION.

Stages of Water in Rivers.—In the table on the right-hand of Chart No. III are given the highest and lowest readings of the Signal Service river gauges during the month, with the dates of same.

During the latter portion of the month *Navigation* on Upper Mississippi was at a standstill, on account of low water—river only one foot above extreme low water mark, no arrivals at Daveuport since the 19th—no boats able to run above La Crosse, all large packets laid up. At Mobile Ala., on the 11th, water in river fell three to four feet retarding navigation. Following the heavy rains of the 12th and 13th, a heavy rise occurred in the Ohio, and in this connection the following notes may be of interest: at Pittsburg the river rose from three feet on the 13th, to 10 feet 8 inches on the 14th. 16th, river falling, "business on river very active, six and a half million bushels of coal shipped down the river on the late rise." At Cincinnati, on the 15th, river rose 20 feet, 8 in. in 24 hours, ending 3 p. m., and rising at the rate of 6 inches per hour; this was the most sudden rise on record; current strong and river filled with heavy drift; several barges drifted away, and one containing 5,000 bushels of coal sunk. 16th, river rose 9 feet; heavy drift passing all day, with fragments of houses, &c.; rising about 1 inch per hour since 3 p. m. 17th, river reached 36 feet, 6 in. during a. m.; small driftwood all day. 18th, river falling; very light drift. At Louisville, on the 16th, light driftwood in river. 17th, heavy driftwood in river. At Cairo, on the 21st, river rose 5 feet, 7 in.; much driftwood. 22nd, river rose 4 feet, 5 in.; driftwood. 23rd, river rose 1 foot, 1 in.; driftwood.

High Tides.—Mt. Desert, Me., 26th; Indianola, Tex., 26th, 29th, 30th; Savannah, Ga., 29th, unusually high tides; Charleston, S. C., 11th, tide unusually high; Smithville, N. C., 11th, 12th, highest tides known for years; Portsmouth, N. C., 12th, tides extremely high in sound; submerging beach and making roads almost impassable; 28th to 30th, tides high and beach submerged; Cape May, N. J., 26th to 28th; Baltimore, Md., 13th, wharves and streets overflowed.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—1st, N. Y., Va., Ill., Ia., Me., Mo., N. H., N. J., Ohio, Pa., S. C. Vt., Col., Fla., Ala., Minn., Mass. 2nd, Mass., Mich., N. Y., Va., Ill., Ind., Me., N. H., N. C., Ohio, S. C. Vt., Ala. 3rd, N. Y., Conn., Me., Mass., N. J., Ohio, Pa., Utah, Vt., Va., Mich., W. Va., Ga., N. C. 4th, Fla., N. Y., Va., Conn., N. J., Pa., Tex., Col., Ga., N. C. 5th, N. Y., Va., Conn., Mass., Neb., N. J., Pa., Wis., Col., Dak., Mich., N. C., Conn. 6th, Col., Ia., Kan., Mo., Neb., Wis., Tex., N. C., Me. 7th, Wy. Ty., Ia., Kan.,